GUJARAT TECHNOLOGICAL UNIVERSITY

Wireless Communications Networks and Systems (EC)

M.E. Semester: II

Subject Name: **Ad hoc Networks**

Sr. No.	Course Content
1.	**FUNDAMENTALS:** Introduction – Fundamentals of Wireless Communication Technology – The Electromagnetic Spectrum – Radio Propagation Mechanisms – Characteristics of the Wireless Channel – IEEE 802.11a–b Standard – Origin of Ad hoc Packet Radio Networks – Technical Challenges – Architecture of PRNETs – Components of Packet Radios – Ad hoc Wireless Networks – What is an Ad Hoc Network Heterogeneity in Mobile Devices – Wireless Sensor Networks – Traffic Profiles – Types of Ad hoc Mobile Communications – Types of Mobile Host Movements – Challenges Facing Ad hoc Mobile Networks – Ad hoc wireless
2.	**AD HOC ROUTING PROTOCOLS :** Introduction – Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks – Classifications of Routing Protocols – Table–Driven Routing Protocols – Destination Sequenced Distance Vector (DSDV) – Wireless Routing Protocol (WRP) – Cluster Switch Gateway Routing (CSGR) – Source–Initiated On–Demand Approaches – Ad hoc On–Demand Distance Vector Routing (AODV) – Dynamic Source Routing (DSR) –Temporally Ordered Routing Algorithm (TORA) – Signal Stability Routing (SSR) – Location–Aided Routing (LAR) – Power–Aware Routing (PAR) – Zone Routing Protocol (ZRP).
3.	**MULTICASTROUTING IN ADHOC NETWORKS:** Introduction – Issues in Designing a Multicast Routing Protocol – Operation of Multicast Routing Protocols – An Architecture Reference Model for Multicast Routing Protocols –Classifications of Multicast Routing Protocols – Tree–Based Multicast Routing Protocols– Mesh–Based Multicast Routing Protocols – Summary of Tree and Mesh based Protocols – Energy–Efficient Multicasting – Multicasting with Quality of Service Guarantees – Application – Dependent Multicast Routing – Comparisons of Multicast Routing Protocols
4.	**TRANSPORT LAYER– SECURITY PROTOCOLS:** Introduction – Issues in Designing a Transport Layer Protocol for Ad hoc Wireless Networks – Design Goals of a Transport Layer Protocol for Ad hoc Wireless Networks –Classification of Transport Layer Solutions – TCP over Ad hoc Wireless Networks – Other Transport Layer Protocols for Ad hoc Wireless Networks – Security in Ad Hoc Wireless Networks – Network Security Requirements – Issues and Challenges in Security Provisioning – Network Security Attacks – Key Management – Secure Routing in Ad hoc Wireless Networks
5.	**QoS AND ENERGY MANAGEMENT:** Introduction – Issues and Challenges in Providing QoS in Ad hoc Wireless Networks – Classifications of QoS Solutions – MAC Layer Solutions – Network Layer Solutions – QoS Frameworks for Ad hoc Wireless Networks Energy Management in Ad hoc Wireless Networks – Introduction – Need for Energy Management in Ad hoc Wireless

	Networks – Classification of Energy Management Schemes – Battery Management Schemes – Transmission Power Management Schemes – System Power Management Schemes
6.	Wireless Sensor Networks-Introduction. Sensor Network Architecture.

Text Book:

1.C. Siva Ram Murthy and B. S. Manoj, "Ad Hoc Wireless Networks Architectures and Protocols", Prentice Hall, PTR, 2004.

Reference Books:

1. C. K. Toh, "Ad Hoc Mobile Wireless Networks Protocols and Systems", Prentice Hall, PTR, 2001.
2. Charles E. Perkins, "Ad Hoc Networking", Addison Wesley, 2000